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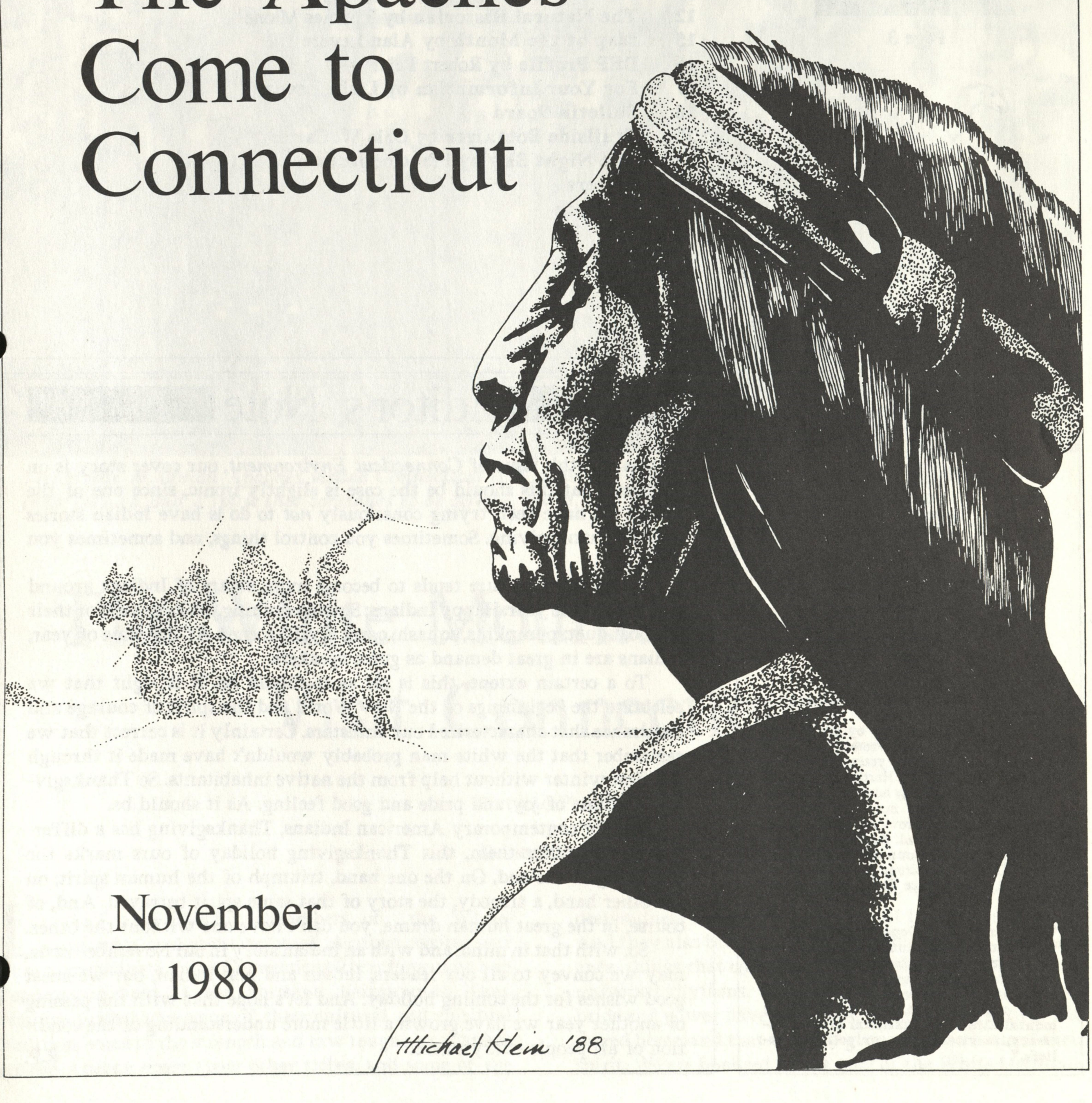
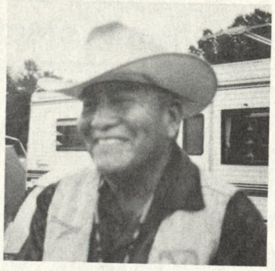
The Citizens' Bulletin of the Connecticut Department of Environmental Protection

The Apaches Come to Connecticut



November
1988

CONNECTICUT
ENVIRONMENT
November 1988
Volume 16 Number 3
$6/year



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Cover by Michael D. Klein

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DEP Connecticut Environment

Published 11 times a year by the Department of Environmental Protection. Yearly subscription, $6.00; two years, $11.00. Second class postage paid at Hartford, Connecticut. Please forward any address change immediately. Material may be reprinted without permission provided credit is given, unless otherwise noted. Address communications to Ed., **DEP Connecticut Environment.** Dept. of Environmental Protection, Rm. 112, State Office Bldg., Hartford, CT 06106.

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Editor's Note

In this month's issue of *Connecticut Environment*, our cover story is on Indians. That this should be the case is slightly ironic, since one of the things we have been trying consciously *not* to do is have Indian stories around Thanksgiving. Sometimes you control things, and sometimes you don't.

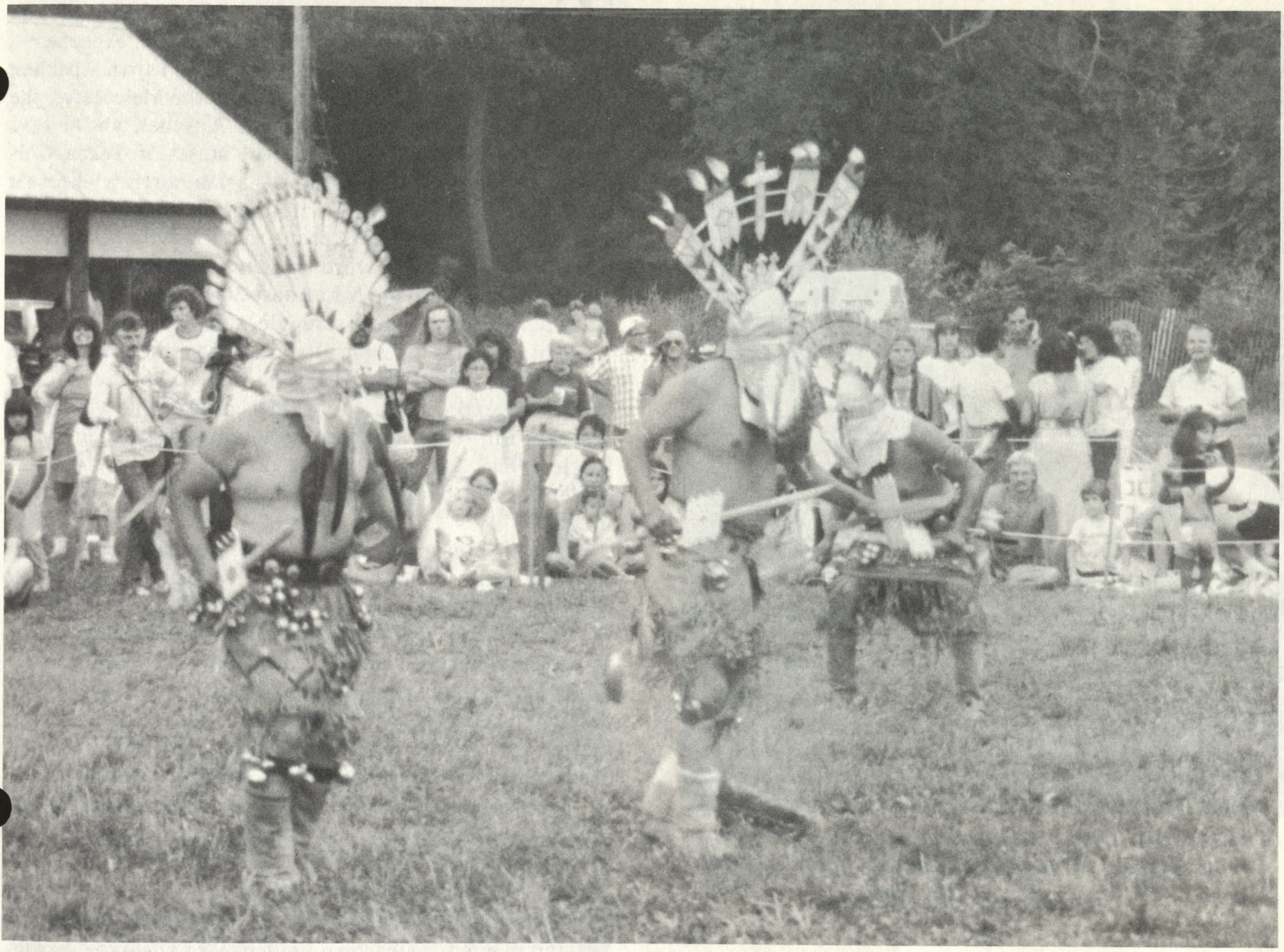
Mainstream culture tends to become more aware of Indians around this time of the year. Happy Indians; Squanto joining the Pilgrims for their first banquet; pumpkins, squash, corn; idyllic scenes. At this time of year, Indians are in great demand as guest speakers.

To a certain extent, this is all as it should be. It is right that we celebrate the beginnings of the New World and the spirit of courage and endurance that characterized our ancestors. Certainly it is correct that we remember that the white man probably wouldn't have made it through the first winter without help from the native inhabitants. So Thanksgiving is a time of joy and pride and good feeling. As it should be.

But for contemporary American Indians, Thanksgiving has a different meaning. For them, this Thanksgiving holiday of ours marks the beginning of the end. On the one hand, triumph of the human spirit; on the other hand, a tragedy, the story of that same spirit betrayed. And, of course, in the great human drama, you can't have one without the other.

So, with that in mind, and with an Indian story in our November issue, may we convey to all our readers, Indian and non-Indian, our warmest good wishes for the coming holiday. And let's hope that with the passing of another year we have grown a little more understanding of the condition of all people everywhere.

R.P.



The White Mountain Apaches visited Connecticut this summer. They brought with them their traditional dances, their culture, and a spirit that continues to be strong, proud, and fierce.

The White Mountain Apaches Visit Connecticut

Text and Photos
by
Robert Paier

LAST AUGUST, members of the White Mountain Apache tribe of Arizona visited our state to participate in the Connecticut River Powwow and Rendezvous held at the Portland Fairgrounds. They brought with them some of their cultural and spiritual tradition, some of the strength and raw toughness that has set the Apache apart from other tribes, and some of the deep sadness and heartbreak that all Indians understand. And they also brought with them dignity and inner balance, things that come from living in tune with natural, universal rhythms. We are grateful that these people of pride and power have come here from their beautiful and sacred homeland that we may glimpse just a little of their spirit. We are honored by the visit of the White Mountain

Indian dancing is a celebration of natural rhythms and processes; through the dancing, the individual reconnects to the totality of the world.

Apaches. May their visit help bring harmony and respect among all people. May we learn something from their visit.

> *"The Apache can endure fatigue and fasting and live without water for periods that would kill the hardiest mountaineer. Everything he has ever received from the white man is a luxury which he can do without as he has done from time immemorial. In fighting them, we must of necessity be the pursuers, and unless we can surprise them by sudden and unexpected attack, the advantage is all in their favor. In Indian combat it must be remembered that you rarely see an Indian; you see the puff of smoke and hear the whiz of his bullets, but the Indian is thoroughly hidden in the rocks and even his exact hiding place can only be conjectured."*
>
> Major General George Crook

THERE ARE TWO MAIN BRANCHES of the Apache tribe: the Eastern, or Plains, Apaches -- including the Jicarella (Little Basket) and Lipan Apaches; and the Western Apaches -- including the Mescaleros, the Chiracahuas, the White Mountain Apaches, and a few others. The Apaches inhabited the states of Texas, Colorado, New Mexico, and Arizona -- a vast territory known as "Apacheria." There are a number of theories as to the derivation of the word Apache, one of which is that it comes from the Zuni word *apachu*, meaning "enemy."

From 1600 and on, for almost 300 years, the Apaches were involved in a great struggle, with nothing less than their survival as a people at stake. The first enemy were the Spanish conquistadores, who raided Apache villages on slaving expeditions. From the beginning, however, the Apaches impressed anybody who dared take them on in battle. "The Apaches," wrote one of the early Spanish raiders, "hurl themselves at danger like people who know no god."

The Spanish introduced liquor to the Apaches and supplied them with dysfunctional weapons; the approach was to destroy by creating weakness from within.

After 1800, the Mexicans became the greatest threat to the Apaches. It was the Mexicans who took genocide from just a vague, unstated attitude to the level of an explicit tactical goal. The Mexicans instituted a bounty system for Apache scalps -- 100 pesos for a man, 50 for a woman, and 25 for a child. The Apaches stood firm.

It was not until 1850, however, when a significant Anglo population began to establish itself in the Southwest, that it became clear to everyone that the course of history had changed. During the next 35 years, with such names as Diabolo, Cochise, Geronimo, and Eskiminzin appearing in even the Eastern newspapers, the Apaches continued to defend, against all odds, their old lands and their life-way. Finally, in 1886, it was all over; the last of the Apaches were relegated to the reservations. Just a little over a hundred years ago. Not such a very long time.

EDGAR PERRY is a White Mountain Apache. If you don't believe the Apaches' reputation for being very serious fighting men, one quick, side-long glance from him will probably convince you. Perry is tall, powerfully built, and the vibes he sends out are of defiance, toughness, and right-now readiness.

"Our reservation is maybe the best of all reservations. We have natural beauty and abundant resources. The reason we have such a good place is that the Apaches have always been, well, more aggressive." Edgar Perry is clearly a well-educated, wise, and good man. He also has, like so many Indians, a gentle and lightning-fast sense of humor. But there is also about Edgar Perry that certain something that makes you feel better knowing you won't have to go one-on-one against him in some lonely desert canyon.

"One of my jobs on the reservation is to teach our children the Apache language. It is important that we preserve and carry forward our way of life."

For those who are intersted in building up a little Apache vocabulary, *netahe* means someone who has taken an oath to forsake everything in order to kill intruders, and *Pinda-lick-o-ye* means "white eyes."

THE APACHES PERCEIVE and live in a universe pervaded by vibrant, creative, living power. Direct contact with that power is available to anybody, but it is the medicine man, or *di-yin*, by virtue of his innate sensitivity, or because he has undergone special training, who wields it. Different medicine men draw their power from different sources -- the wind, lightning, thunder.

The relationship of the medicine man to his power is always tentative and provisional. The power can be augmented or diminished; it wanes as the medicine man grows older; it can be negotiated with -- "If you do this, I will do that." And, if the power is abused, it can be lost.

Used positively, the power is for healing, for regaining personal and universal balance. The power may be used in war, for locating enemies, and for health.

Negatively, the power may be used purely for destructive purposes. The Apaches recognize witches, whose function is to promulgate evil for its own sake.

The medicine man is an adept at the complex and interlocking symbolism of colors, compass directions, and natural processes. Often he will prescribe herbal remedies.

The famous Apache chief Geronimo was a medicine man; his power was for war. As he grew older, when his prodigious physical strength amazingly did not desert him, members of his immediate family suffered a number of premature and inexplicable deaths. A medicine man was consulted, and a special ceremony was performed to learn the cause of the misfortune. In the middle of the ritual, the medicine man stopped and pointed a finger at Geronimo -- "They are dying because of you. You have stolen their life energy to maintain your own. You are a witch."

PAUL ESTEBAHN is the medicine man for the White Mountain Apaches. He learned from his grandfather who learned from his father before him. Paul is somewhere around 50 or 60 years old. He is in good shape, his skin and eyes are clear, and his manner is relaxed and easy. "Yes, I am a medicine man -- I know how to sing all the songs."

Sometimes talking to a medicine man can be a strain. You want to be respectful; on the other hand, time flies, and you also want to get to the heart of what he has to say.

"People say medicine men have special powers. Do you have special powers?"

"Oh, yes. I can make it rain. I have done that many times."

"Can you teach other people to do that?"

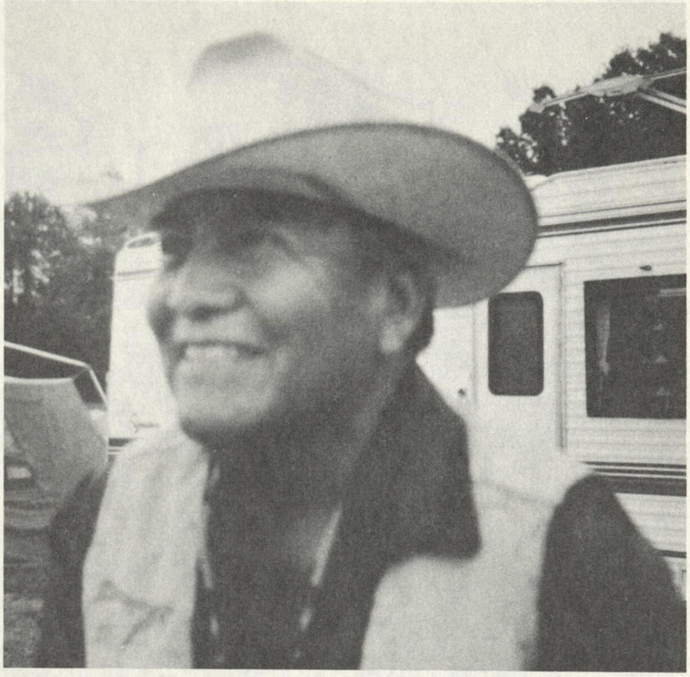
"Yes, I have about six students right now. But you have to do ceremonies, and you have to stay awake for four days and nights, with no sleep. Nowadays, people don't like to do that." Paul spoke of his ability to cure disease with herbs. "I have cured many people in my tribe." Then he smiled, a very open, almost childlike smile. "Back home, I'm a very popular fellow."

Paul also spoke of his renown as a rodeo champion. A hard sport for someone his age. "Yes, you have to be strong."

And then he had to leave to prepare for his dancing. "We have traveled all over with our dancing. We have been to Paris and next year we go to Tokyo."

Do the dances have ceremonial or symbolic meaning? "These are social dances. The ceremonial dances are kept back home. We don't usually do them outside the reservation."

Paul Estebahn beats the Indian drum. He indicates that the most sacred dances are only done on the reservation.



Apache Medicine Man Paul Estebahn still sings the old songs, understands the healing properties of herbs, and draws his power from natural forces.

And that was it. A brief interview with a medicine man. It wasn't possible to tell how seriously he took our discussion. If he took it seriously at all.

IF YOU WANT TO SEE the difference between white (or at least, American-Anglo) and Indian culture, you don't have to look much farther than the dancing. Our dancing is almost exclusively a celebration of the ego -- "This, ladies and gentlemen, is me." We celebrate our own talent, our own good looks, our own individuality, as opposed to anyone or anything outside. Indian dancing is not like that. The particular human being who is performing at any given time is quite incidental to the dance. What is important, what is celebrated, what is harmonized with, is the totality of universal process. The colors are simple earth-colors; the rhythms are strong and repetitive, like the rhythm of a mountain. The chanting is deep and primal, from a bottom-line, basic level of existence. It is the sound of the wind, the rivers, and the wild creatures of the earth.

That's all there in Indian dancing.

FOR SOME REASON that I couldn't quite figure, the essence of the White Mountain Apaches remained elusive. I couldn't get a read-out that I felt comfortable with, I couldn't get what they were thinking, how they felt about being here. To a certain extent, that is to be expected. They are of another culture, from a very, very different part of the country, and I only spent, at most, a few hours with them. On the other hand, and I say this with some modesty, I think I have more of an awareness of and appreciation for things Indian than most non-Indians do. I am not an authority and am not a follower of the Indian life-way, but I do in fact participate regularly in Indian ceremonies and I have spent time -- lots of time -- in places where Apaches used to ride. So, I thought we would be able to hit a common denominator quickly and easily. It never happened, and that caused me some concern. Why couldn't we connect?

I spoke of my problem to a friend, a man who walks sure-footedly, uncannily between two cultures. I asked what I knew to be an intelligent and perceptive question, a question which implied an understanding of the two cultures, and an ability to compare and contrast them. It was a good question.

"If you'll excuse me," said my friend, "that is a white man's question."

Oh, boy. And there it is.

Everything is your gentle teacher.

So. A little humility. A little *more* humility

Maybe it just isn't possible to get "a handle on" the Indian way unless you've been born into it, unless you have a sense of what it's like to have a bounty on your child's head, unless you can touch the power of the thunder and the wind.

Maybe that's not possible. But, what is possible, and I think necessary, is that we become aware that there is such a thing as the Indian way, and that we respect it. Not for what we think it is, not for what we want it to be, but for what it is. We are all who we are. That's all. That's enough. That is the truth; that is the source of mutual respect, honor, and strength. That *is* the Indian way. ■

THE WHITE MOUNTAIN APACHES have returned to their homeland now. May they always walk in peace and health and happiness. May only good things happen for them. And may they come again to our state of Connecticut, where they will always be welcome, honored, and respected.

And to that, my brothers everywhere, I say, *Ho!*[*]

---

[*] *Ho* is an Indian word that means "good," or "amen." The idea is that what has just been said is considered the truth.

Nature Notes

An Old Fashioned Nutting Party

Text and Illustrations
by
Penni Sharp

BY EARLY NOVEMBER, the fall season is already half spent. In Connecticut, the rich autumn colors have faded, and frost has blackened many of the wildflowers and ferns. It's the tail end of the harvest season now, and time to pick the last of the hardy vegetables and flowers. It's also the last chance for harvesting wild foods. Today, with the local supermarket offering strawberries in January, it is difficult to even conceive of a time when food eaten during winter had to be picked, prepared, and stored at the previous harvest.

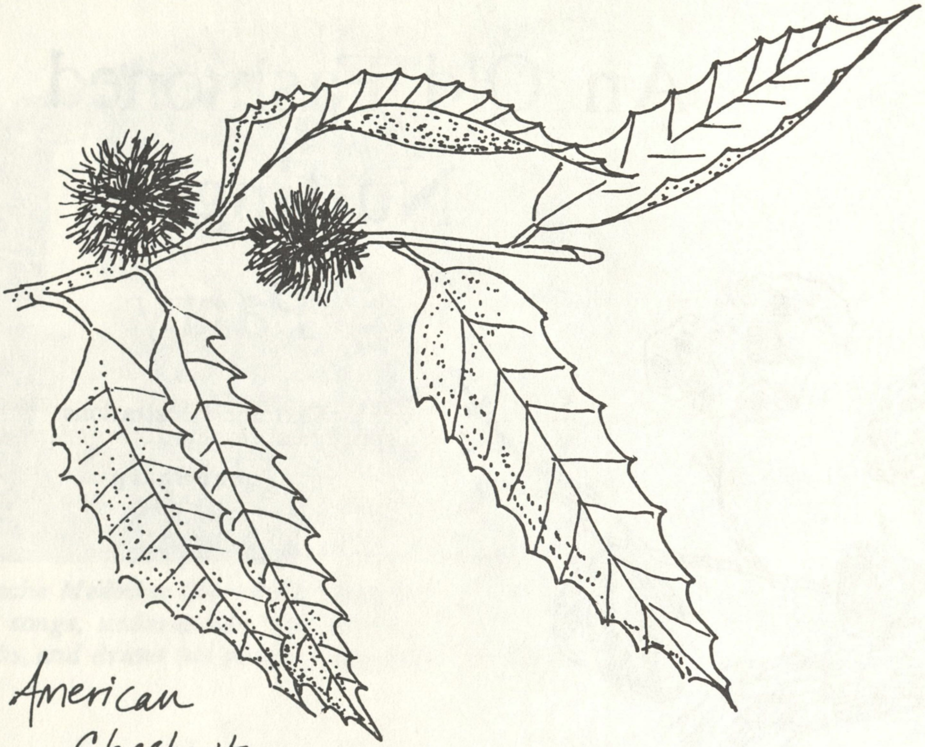
ALTHOUGH THE DIET of our predecessors was not as varied as ours, it was probably healthier. While some of the staples of the Colonial kitchen had to be planted, a number of popular food items, such as nuts, could be found in the wild.

Nut gathering was a social occasion, and "nutting parties" were organized during October and November. Today, the chief nut-gatherers of our woods are the squirrels.

Wild hickory nuts and walnuts are smaller than those grown commercially. However, as they have not been treated with pesticides or been genetically manipulated, they are more flavorful than the store-bought varieties. For these reasons, a contemporary nut party might be worth a try.

SHAGBARK HICKORY (*Carya ovata*) played an important role in the lives of our predecessors,and was valued especially for its meaty fruits. The nuts were a popular food among Indians and were ground to a paste from which a liquid "milk" was extruded. This liquid was a key ingredient in much of Indian cookery. Early settlers also were fond of the hickory nut. Not only was this tree appreciated for its nut production at harvest time, but also for its wood, which is hard and strong and is still used for axe handles, hoe handles, and wheel spokes. The hot-burning, aromatic hickory was the favorite wood for the smokehouse, and today meats are still cured with hickory smoke. It is an excellent firewood in that it has a high heat value and throws few sparks.

Shagbark hickory is easy to recognize at any time of year. On mature trees, the bark warps away from the tree trunk in broad plates that are a foot or more long. It is the only tree that has such distinctive medium-gray exfoliating bark. The shagbark has compound alternate leaves that are from eight to 14 inches long. Leaves usually have five leaflets, occasionally seven, which are elliptical and finely-toothed.



American Chestnut

The nut is encased in a yellowish green aromatic husk which can measure up to two and one-half inches in diameter. The husk divides evenly to reveal the nut, which is four-angled.

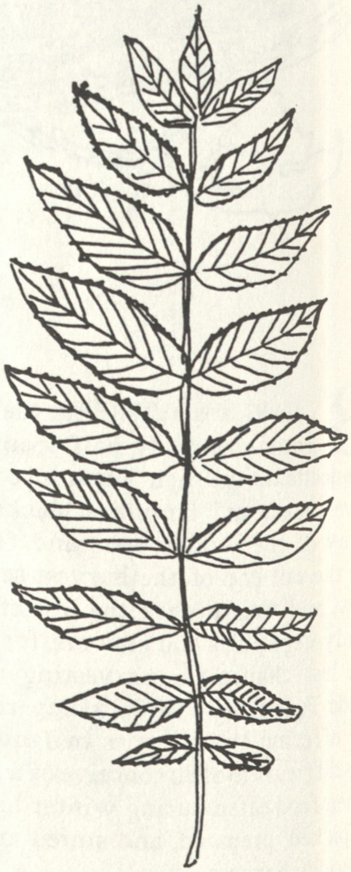
The shagbark does best on deep, moist soils and can exceed 100 feet in height. It also is a common tree along hedgerows. Hickory is rarely a dominant tree; it is often in the company of oaks as a sub-dominant. It is a tree worth our attention for a number of reasons, not the least of which is its edible product.

LESS COMMON in our woodlands is black walnut (*Juglans nigra*). It is one of our finest hardwoods and has been used for centuries for the making of fine furniture. It is the preferred wood for gunstocks, as it never warps or shrinks and produces little jarring or recoil. Once widespread in eastern woodlands, it has become relatively scarce. During World War I, crews were sent to locate walnut trees to manufacture guns and airplane propellers. In furniture making, walnut is prized for its fine grain and its veneer.

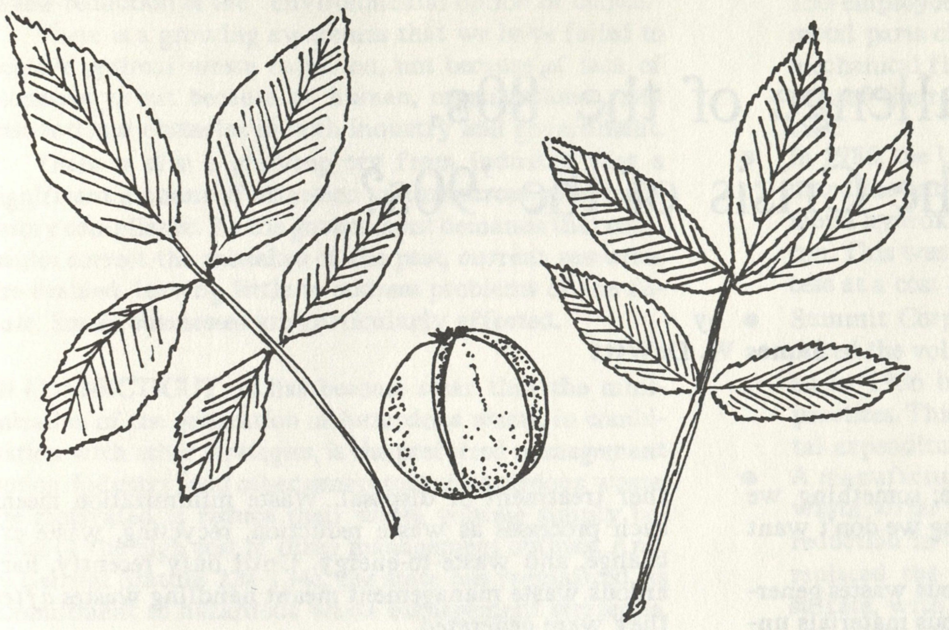
The fruit of the walnut is a large sweet nut, surrounded by a fleshy husk. Walnuts are delicious and were most popular during Colonial nutting parties. In those days, walnut trees were abundant, and the nuts were a part of every household's winter store.

Black walnuts have other interesting attributes. The nuts and husks were used in dye-making, producing rich tan, brown, or black tones, depending upon the mordant used. The tree seems to be allelopathic in that it suppresses the growth of other plant species in its vicinity; this is probably due to the release of substances that inhibit plant growth. Tomatoes and apples are difficult, if not impossible, to grow in the vicinity of a black walnut.

During the growing season, the tree can be recognized by its long, alternate, compound leaves. Each leaf has from 15 to 23 leaflets. The bark is dark



Black Walnut leaf


Shagbark hickory nut & leaves (not to scale)

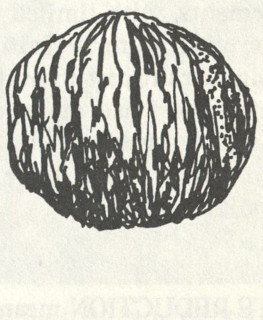
brown and furrowed, with older trees showing deep furrows. The twigs of black walnut are stout and have a buff-colored chambered pith. This is a good identifying feature, particularly in winter when it is leafless. Black walnut grows best on deep, rich moist soils. While it may grow on poorer sites, it does so at a slower rate.

NO DISCUSSION of nut-producing trees is complete without mention of the American chestnut (*Castanea dentata*). Until the beginning of this century, the American chestnut was one of the most important of the eastern hardwoods. It was a fast-growing tree which sprouted readily when cut, quickly producing new trees. Its wood was rot-resistant when in contact with the ground. In some of Connecticut's older, historic homes, chestnut panelling and flooring can still be seen, a testimony to the versatility of the tree. The sweet nut of the chestnut was delicious, and great quantities were gathered at harvest time. The demise of the chestnut was swift. In the early 1900s, a fungus disease that attacked the chestnut reached this country from Asia, possibly from imported Chinese chestnuts which, although infected, are resistant to the disease. Our native chestnut showed no resistance, and the fungus proved deadly. The blight (*Endothia parasitica*) enters the bark at cracked areas in the crotches of limbs. It attacks the cambium layer, the inner living bark, killing it entirely. The fruiting bodies then extrude through the cracking outer bark where they produce spores. When windborne, the spores can spread the infection. The blight was first noticed in 1904 and in less than a human generation, the tree had all but vanished from our woodlands.

THERE IS HOPE, however. The chestnut, as previously noted, is a vigorous sprouter, and small chestnuts are scattered throughout our woods as sprouts of former giants. Some grow large enough to produce fruits. The chestnut is most easily recognized by its long, narrow, coarsely-toothed leaves. The leaves grow alternately on brownish, smooth twigs. The nuts, when present, are encased in a spiny husk, each nut being flattened on at least one side. Mature trees once reached a height of 100 feet; now most are less than 15 feet.

The sprouts grow to small tree size and are then attacked by the blight. However, there is current research on chestnut and the blight, including the inoculation of trees with a hypovirulant strain of the fungus that can displace the lethal fungus. The Connecticut Agricultural Experiment Station is working on the chestnut blight as are other institutions, such as the Brooklyn Botanical Garden. I like to think that efforts will some day pay off and that the chestnut will once again be a major tree of our forests. If this happens, I imagine that there may be renewed interest in nut gathering. The chestnut has a delicious flavor, gives a wonderful aroma when roasted, and is a part of our New England heritage.■

Black Walnut



The Challenge of the '80s, or the Crisis of the '90s?

by
James W. DeWitt

WASTE -- something we all generate; something we would rather ignore; certainly something we don't want in our backyards.

What is this waste? It is the hazardous wastes generated by industry; the household hazardous materials under our sinks; infectious wastes produced at health-care facilities; incinerator ash from the resource recovery plants; bulky wastes from excavations; solid wastes that the garbage man takes away early in the morning to some mysterious place; and low-level nuclear wastes generated at nuclear power plants and medical facilities. And it is piling up. We do a lot of talking about it these days, but few of us are able to offer constructive solutions.

PUBLIC AWARENESS of the waste problem changes with the times and is, to a large extent, manipulated by the media. With Love Canal, we suddenly became aware of problems in hazardous waste disposal practices. Later, we learned about the closing of the state's sanitary landfills, garbage-laden barges, and closed beaches. Then we learned that the construction of resource recovery plants, while representing steps in a positive direction, creates a new waste by-product. And recently, thanks to the efforts of DEP and the League of Women Voters, we have become aware of the importance of household hazardous waste management.

The management of industrial hazardous waste, while not in the limelight recently, continues to be a priority in Connecticut. With more stringent regulatory requirements, with limited treatment and disposal alternatives, with clearer definitions of financial liability, and with significant cost impact on the manufactured product, hazardous waste management has become an integral factor of doing business in Connecticut. This applies to *all* generators of wastes -- large corporations and small businesses alike.

WASTE REDUCTION means to reduce the generation of hazardous wastes in order to avoid the necessity for further treatment or disposal. Waste minimization means such processes as waste reduction, recycling, waste exchange, and waste-to-energy. Until only recently, hazardous waste management meant handling wastes *after* they were generated.

In 1976, the U.S. Congress enacted the Resource Conservation and Recovery Act (RCRA). Although the language implies an emphasis on preservation of our natural resources and recycling, the original RCRA regulations set standards for generators of hazardous waste in regard to labeling, storage, and handling, as well as specifying where, how, and when wastes could be treated and disposed. No emphasis was placed on limiting the generation of hazardous wastes in the first place.

Congress began to focus on waste minimization with the 1984 Amendments to RCRA, thereby creating a national waste reduction policy. Generators are required to certify on each hazardous waste manifest (a document that accompanies each shipment) that there is "a program in place to reduce the volume and toxicity of waste generated." The Amendments also initiated requirements that the generator submit a biennial report indicating efforts to reduce waste volume and the reduction actually achieved.

The 1984 RCRA Amendments also charged the federal Environmental Protection Agency (EPA) with the responsibility to submit a report to Congress on the feasibility and desirability of establishing waste minimization regulations.

ALTHOUGH RCRA PROVIDES some regulatory framework, most successful industrial waste reduction activities are a result of good business practices and plain common sense.

In its 1986 report to Congress, the EPA concluded that mandatory waste reduction programs would not be feasible or even desirable. The report stressed that government can be most effective in promoting voluntary waste minimization by providing information, technology transfer, and assistance to waste generators at the state level.

The federal Office of Technology Assessment (OTA), in its 1987 report, agreed that there should be a concerted effort to reduce the generation at the source and that waste reduction is the "environmental option of choice."

There is a growing awareness that we have failed to achieve optimal waste reduction, not because of lack of technology, but because of human, organizational, and institutional obstacles in both industry and government.

There is also a growing cry from industry that a significant amount of attention and resources go to regulatory compliance. As the government demands that companies correct the mistakes of the past, current resources are drained, leaving little to address problems of the future. Small businesses are particularly affected.

IN CONNECTICUT, it has become clear that the minimization of the generation of hazardous waste, in combination with other strategies, is the preferred management option. Industry, and other generators of hazardous waste, are motivated to reduce their waste volume simply because of the high cost of other management options. And, in General Statute 22a-134c, the state has formalized its commitment to hazardous waste management strategies, with waste reduction at the top of the list.

WHILE WE HAVE MADE PROGRESS, more can be done. It is considered that the following steps would improve the recycling of hazardous wastes in Connecticut:

- Connecticut's hazardous waste tax must be restructured to provide incentives to recycle wastes.
- The technical assistance programs of the Hazardous Waste Management Service and the Department of Economic Development must be enhanced.
- Exchanges, both of information and of wastes, must be encouraged.
- Coordination between the Environmental Quality Units of DEP must be improved.
- The DEP and the Connecticut Hazardous Waste Management Service must establish coordinated and consistent goals.
- Financial assistance, in the form of loans and grants, must be made available to business and industry.
- Connecticut's large corporations must take the lead as models for successful waste minimization programs.
- The research activities of the University of Connecticut's Environmental Research Institute must be supported by both the public and private corporation sectors.

AND, FINALLY, we can be proud that in Connecticut not all the news in regard to hazardous wastes is bad.

- Since 1986, the DEP, the Connecticut Association of Metal Finishers, the Connecticut Hazardous Waste Management Service, the Institute of Water Resources, and the Environmental Research Institute have jointly sponsored an annual conference highlighting advanced waste treatment technologies for the metal finishing industry. Over 150 Connecticut firms have been represented at these conferences.
- In 1983, Whyco Chromium Company, a 150-employee electroplating company, converted a metal parts cleaning operation from a chemical to a mechanical finishing process. As a result, the generation of their cyanide waste was reduced by 98 percent.
- In 1985, the Upjohn Company of North Haven eliminated the annual generation of 10,000 tons of a dilute metal hydroxide sludge containing lead, iron, and silicon. This was the result an innovative treatment process at a cost of $1.5 million.
- Summit Corporation of America of Thomaston reduced the volume of metal hydroxide sludge generated in 1986 by 110 tons by improved management practices. This was accomplished without major capital expenditures.
- A manufacturer in northern Connecticut changed its waste water treatment, bringing about a 50-percent reduction in waste sludge generation. The company replaced the standard treatment chemical, ferrous sulfate, with iron pellets dissolved in sulfuric acid.

WASTE MANAGEMENT, "the challenge of the '80s," will be "the crisis of the '90s" unless we, the people of the state, realize that each of us contributes, directly or indirectly, to the generation of every pound or gallon of waste by-product generated in Connecticut. It is therefore our responsiblity to guarantee that wastes are managed in a mannner to protect the environment and public health, that we adequately plan for and implement ample treatment and disposal alternatives for all the wastes we generate, and that we are all advocates of waste reduction and recycling.

The author is president of Connecticut Resource Group, Inc., executive director of the Connecticut Association of Metal Finishers, and a member of the Environment/2000 Advisory Board. ■

We all contribute, directly or indirectly, to the total of Connecticut's waste stream. (DEP file photo)

The Natural Historian

Chinese witch hazel (Hamamelis mollis) *in full bloom; this non-native plant often blooms when the snow is melting.* (*Photo: Tom Mione*)

Chinese witch hazel blossoms after *meyer)*

The Mysterious Properties of Witch Hazel

by
Thomas Mione
Graduate Student
Department of Ecology and
Evolutionary Biology
The University of Connecticut

THE LAST NATIVE TREE to bloom in eastern American forests is the common witch hazel (*Hamamelis virginiana*). This relatively small (generally 15 to 20 feet in height), often multiple-trunked tree is widely distributed. In the northern portions of its range (eastern Canada and our northern states) it blooms as early as September, while at the southern end of its range (eastern Texas through northern Florida) it blooms as late as December. In Connecticut, common witch hazel blooms from late September through early November, depending on such conditions as altitude and direction of exposure. At the same time as the delicate, light-yellow, spider-like blossoms emerge, the leaves turn a contrasting crisp golden-brown. This display is comforting when we see other plants and creatures preparing for winter; the flowers promise new life.

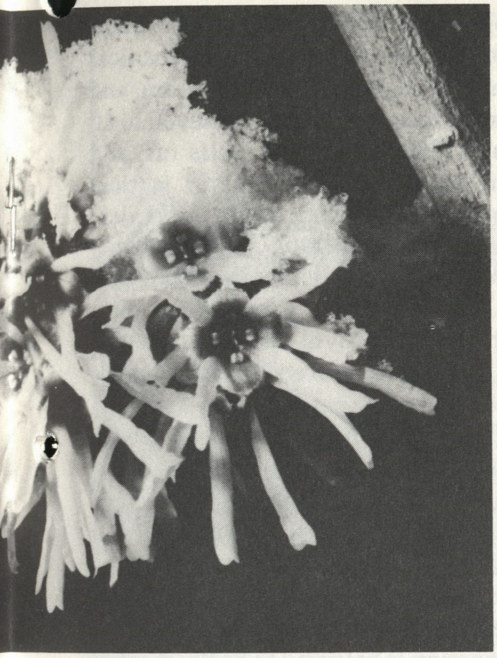
INDIANS of eastern North America used common witch hazel to treat skin ailments, to rub on sore muscles, and as an emetic after poisoning. Even eye disorders were treated with a decoction made from the bark. Some tribes used the black, shiny seeds as sacred beads in ceremonies.

The name "witch hazel" may come from the early Americans who used the forked branches as "divining rods" (or "witching sticks") to locate underground water and precious metals.

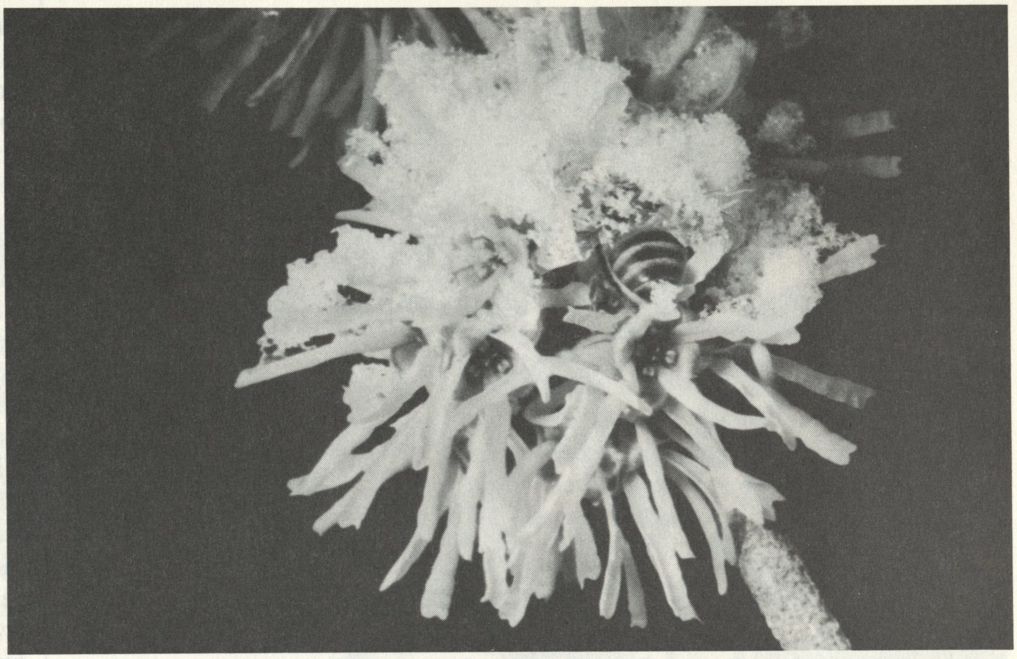
The witch hazels (genus *Hamamelis*) are a group of six or seven similar species with a disjunct distribution in eastern North America to northern Central America and eastern Asia. Stretching the American range of the genus is the little known Mexican witch hazel (*H. mexicana*) which has been collected only once.

Witch hazels are characterized by their shrubby to small-tree shape, asymmetrically-based leaves with wavy to scalloped edges, and delicate spider-like flowers. The four yellow to orange, bronze or even red, strap-like petals uncoil during anthesis (flower opening) -- much like a fern's fiddle head in the spring. The winter to spring blooming witch hazels make good natural thermometers; on colder days, petals recoil.

The fruit of all witch hazels is a distinctive, two-parted, woody capsule that forcibly ejects one or two seeds at maturity. The common witch hazel discharges its seed when the



a spring snowfall. (Photo: Carl Retten-



Blossoms of the Chinese witch hazel photographed on March 15 in Storrs, showing a honey bee which got too cold to return to its hive. (Photo: Carl Rettenmeyer)

flowers of the current year are expanding. To see how far the seeds are projected, try this simple experiment: In the autumn, pick a few capsules of the common witch hazel and place them on a table in a room you often spend time in. When the fruit becomes dry, it expels its contents and, if you're lucky, you will hear the seed as it lands somewhere in the room.

IN CONTRAST with common witch hazel's autumn floral display are the late winter through early spring flowering witch hazels. Perhaps the most impressive and most common is the Chinese witch hazel (*Hamamelis mollis*) with flowers emerging in late January (at the Arnold Arboretum in Jamaica Plain, Massachusetts) through March. The similar Japanese witch hazel blooms in the early spring (as early as late February). In the late 1920s, these two Asian diplomats spontaneously hybridized at the Arnold Arboretum. One especially attractive plant was selected from the progeny and has now come to be known as the "Arnold promise" (*H. x intermedia*).

The smaller vernal or Ozark witch hazel of the American Ozark Mountains is infrequently planted as an ornamental. It is winter-hardy, however, and for those who prefer native species and enjoy a pronounced fragrance, the vernal witch hazel retains a special place.

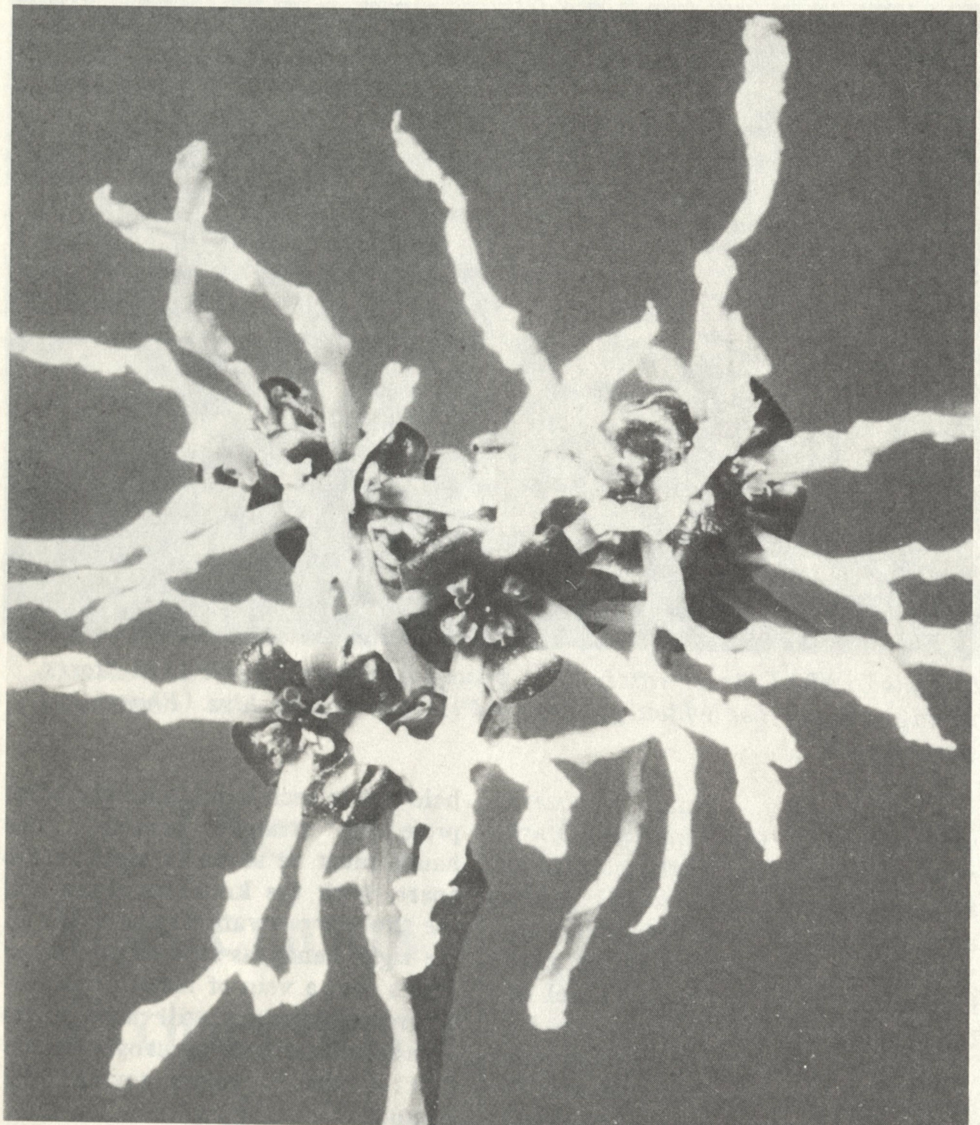
Other native yard and garden members of the witch hazel family (*Hamamelidaceae*) are *Fothergilla* spp., beautiful, spring flowering shrubs from the southeastern U.S., and sweet gum (*Liquidambar styraciflua*), a stately tree that extends as far north as western Connecticut.

THE FORKED BRANCHES of common witch hazel were used as divining rods to locate water and precious metals. Great ritual was often associated with this practice. One author described this process in the following manner: "The 'divining rod' is a Y-shaped section of a branch, with all its leaves removed. It must be new wood and it must have grown upon the tree in such a position that the rising and setting sun looked between the prongs. The two ends of the Y must be held one in each hand, with the point projecting straight forward. The hands must be seven or eight inches apart, with the knuckles down and the thumbs outward. If the rod is in the right hands, as soon as the bearer passes over a vein of metal or an underground spring it will move on its own accord and will twist over till the foot of the Y points toward the ground."

Does it work? Sometimes.

FEW HOME REMEDIES have withstood the test of time as well as aqueous (liquid) witch hazel. This astringent has been used for medicinal purposes for centuries by eastern North American Indians and for the last century by people all over the world. Witch hazel has always been abundant in Connecticut, and nearly all the aqueous witch hazel in the world is manufactured here.

It all started back in Connecticut in the 1860s when Thomas N. Dickinson Sr. met up with Dr. Elmer Whittemore, a drug store owner in Essex. The two began to manufacture witch hazel on a limited basis. Dickinson decided to



Close-up of blossoms of the common witch hazel (Hamamelis virginiana) *which is the last tree to bloom in Connecticut, from late September to November. Common witch hazel is native to Connecticut.* (*Photo: A.L. Bogle*)

expand the market and production and, by the late 1800s, he operated distilleries in Middlesex, New London, New Haven, and Hartford Counties, with the headquarters remaining in Essex.

Dickinson handed down the family business to his two sons, T. N. Dickinson Jr., and E. E. Dickinson who split their father's empire and entered the trade independently, in Mystic and Essex. After four generations of family operation, these companies are no longer owned by Dickinsons. They are still, however, the only two producers in the world.

WHOLE *Hamamelis virginiana* trees are gathered when leafless and dormant by contract cutters who pay to harvest on state-owned land. Trees are cut nearly to the ground, but regeneration occurs rapidly and trees may be cut again in five to 10 years. In addition to the witch hazel harvest of southern New England, in the southern Appalachian Mountains leaves and bark are harvested and exported to Europe for a process different from that of the Connecticut manufacturers.

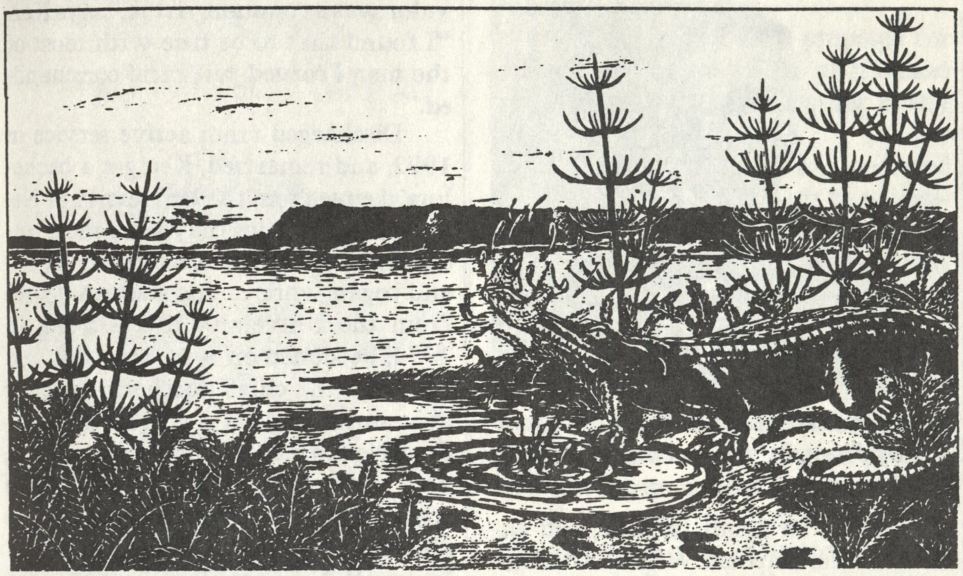
Aqueous witch hazel is made by chopping a known amount of plant material, processing it in a mechanical extractor, injecting it with steam, and then boiling it in water for seven to 10 hours. The vapor that boils off and then recondenses (distillate) is then mixed with the distillate of ethyl alcohol in a vapor mixing/recondensation chamber. Other tricks are surely used but, as one might expect, Dickinson employees are loyal and do not reveal the proprietor's secrets. The final product includes the extract from 8 and 1/3 pounds of brush per gallon and has an alcohol content of about 15 percent.

Most of the active ingredients of witch hazel are believed to reside in the tree in regions of growth in circumference (cambia). The principal active ingredient that causes the astringent action is believed to be "hamameli tannin."

MANY NURSERIES do not offer *Hamamelis* species because of their relative unattractiveness at the time of the year when most impulse buyers do their shopping. However, a variety of ornamental cultivars of the aforementioned species are available from select nurseries. Species of witch hazels can be ordered from Wayside Gardens, Hodges, South Carolina, 29695-0001 (send one dollar for a catalog).

For common witch hazel, I prefer to acquire my stock from the wild; in our area, it is available to the opportunist. This tree can be found above the high-water mark on the banks of rocky streams and in scattered upland sites with rich, well-drained soil. To find out what witch hazel looks like, come visit the recently transplanted wild specimen of *H. virginiana* at The University of Connecticut campus at the northwest corner of the Torrey Life Sciences Building, on North Eagleville Road. Or, rely on the following combination of easy field characteristics: fall fruits and flowers with four linear petals, and leaves with scalloped edges that taper asymmetrically to the leaf-stalk. ■

Map of the Month



Shore scene of a Mezozoic Connecticut Valley lake. The big fellow is the seven-meter phytosaur Rutiodon. (*Drawing by Amy Hubert in* Dinosaurs, Dunes, and Drifting Continents.)

Dino-crackers, anyone?

by

Alan Levere

Senior Environmental Analyst

IT SEEMS THE DINOSAUR theme has caught on at just about every age level. My two pre-school nephews gravitate toward anything that hints of the subject. And, at the other end of the scale, I'm sure I spied a box of dinosaur crackers in the pantry of a university professor friend of mine. Interesting.

Now, some of the truths about dinosaurs can get lost between the purple plastic brontosaurus and the pencil eraser pteradon. Here at the DEP's Natural Resouces Center, we have two publications that will help you sort out the facts from the fiction.

Dinosaurs, Dunes, and Drifting Continents: The Geohistory of the Connecticut Valley by Richard C. Little introduces the reader to some geologic fundamentals. The three main headings, not surpisingly, are dunes, dinosaurs, and drifting continents. Subsections include old seas and sediments, sedimentary rocks (the ones that the dinosaur tracks appear in), Paleo-Indians in the Valley, and land forms and the Ice Age. The book brings you from the age of dinosaurs -- about 200 million years ago -- to the end of the glacial ice age -- about 10,000 years ago. There is also a three-part appendix, with a Connecticut Valley rock identification chart. Twelve line drawings depict dinosaurs that probably inhabited the Connecticut Valley.

In addition, there is the fascinating story of the formation, growth, and disappearance of Glacial Lake Hitchcock. About 13,700 years ago, long after the dinosaurs had disappeared, the 150-mile-long lake formed in the Connecticut River Valley behind a natural dam that occurred in Rocky Hill. It is estimated that the lake was in existence for at least a few thousand years, until finally the natural dams that held the water back eroded and allowed the lake to flow into Long Island Sound.

Sixteen photographs and numerous drawings combine to make this 107-page, soft-cover book an excellent introduction to the geologic story of the Connecticut Valley.

THE SECOND of our featured publications is *Fossils of the Connecticut Valley -- The Age of Dinosaurs Begins*, written by Edwin H. Colbert for the Connecticut Geological and Natural History Survey. This 32-page booklet begins with an explanation of the geologic history of the Central Valley. Cross-sectional drawings help to make the transformation of the landscape over the millions of years easier to understand. A brief history of the discoveries of fossils in the Connecticut Valley leads into a discussion of the nature of fossils, both the fossilized remains and the footprints that we are familiar with. Included are further discussions of plants, fishes, amphibians, and reptiles. The longest section, which is on dinosaurs, recounts the discovery of rare fossilized bones and the more frequently found footprints and trackways in the Connecticut Valley.

BOTH OF THESE publications will not only give the reader a little more understanding of our land and its inhabitants 200 million years ago, but they will also clear up some fictions that may have crept in. Now, at least, you can recognize the difference. And while the books weren't written for children, you don't have to be a university professor to enjoy them.

Now for some of those dino-crackers.

To order, please send $6.50 for *Dinosaurs, Dunes, and Drifting Continents* and $3.00 for *Fossils of the Connecticut Valley*. Please include 7 1/2 percent Connecticut sales tax and $2.00 for handling to: DEP-NRC, Map Sales, Room 555, 165 Capitol Avenue, Hartford, CT 06106. ■

DEP Profile

A Legacy of Dependability

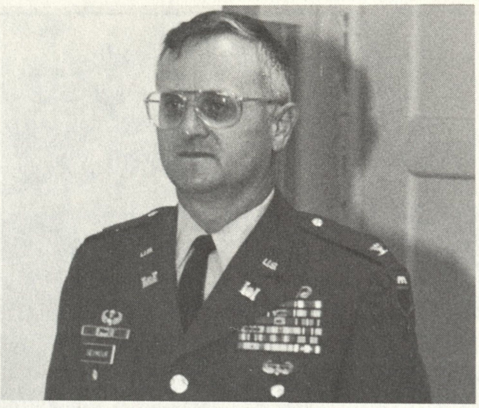
by
Robert Paier

KEN SEYMOUR is the chief purchasing officer for the DEP. The job involves the logistical support of every branch and unit of the DEP. It involves every pencil, pen, desk, car, contract, battery, and computer in the Department. In a real sense, in a very tangible, put-it-on-the-table-and-let's-see-it sense, it may be the most critical position in the DEP. It is, as Ken Seymour says, "the hub of the wheel." Without logistics, the wheel doesn't turn. In order to keep track of an inventory of $215 million, the second highest in the state, you have to know exactly what you're doing. Maybe doesn't get it. Dependability is required.

"This is a hard job," says Ken Seymour. "The nature of the beast is that you mostly hear complaints. For that reason, purchasing has to be streamlined. We are functionally organized and oriented. There is very little extra." How are things going, then? "This office is working very smoothly. The reason for that is the people working here. They are all competent, intelligent, and willing to do what is required to get the job done. My legacy here is my staff. I can depend on all of them."

KEN GREW UP in Saratoga, New York, and he will tell you if you ask him that he and his brother were raised in a home for children. While he remembers this as a nourishing and positive environment, he will not deny that it instilled in him toughness and a very self-reliant approach to circumstances.

The regimentation and discipline helped him later not only in the military, but with dealing with things directly, clearly, and effectively. He quit Hartford High School in his junior year, as an honor student, and enlisted in the marines. While he did not see combat at that time, he served from 1953 to 1959, completed a tour in Korea, and at the age of 18 was the youngest sergeant in the marines.



Ken Seymour, DEP's chief purchasing officer, in formal attire. (Photo: Al Couture)

Upon his discharge from active service, he joined the air force reserve, and subsequently went on airborne operations in Canada and Central America.

In 1966, a second lieutenant in the light infantry, Ken was called back into active duty, and was assigned to Viet Nam. He was there a few months when personal tragedy struck. Ken's wife was killed in an auto accident. He came home. Then, still on active duty, he served as "survivors' assistance officer" for the state of Connecticut. His mission was to carry out burial and survival care for Connecticut soldiers killed in Viet Nam. It was a job that required sensitivity, compassion, and an ability to do a very hard task -- maybe the hardest task -- with no mistakes.

HAVING REACHED THE RANK of captain, Ken completed special forces training, and served for two years in the Far East as a Green Beret. Following this tour, he completed the Engineer Officer Advanced Course. Then, from Janurary 2, 1971, to December 23, 1971, he commanded an engineering company in Viet Nam, his second tour there. "I've heard Iwo Jima described as a place where uncommon valor was a common virtue," says Ken. "I found that to be true with most of the men I served with and commanded."

Discharged from active service in 1972, and remarried, Ken got a bachelors' degree from the University of Nebraska — "because they were most understanding of the Viet Nam vet" — and began work on his master's degree from the University of Hartford. In 1974, he signed on with the DEP, and has been the chief purchasing officer ever since. And he is still in the military. Now a full colonel in the reserve, he is part of the admission field force for applicants to West Point. He is also attending the Air War College at Maxwell Air Force Base, and has continued airborne training all over the world, most recently jumping with the Israeli army. He was the funding chairman for the recently-established memorial in West Hartford honoring veterans of all wars. "I learned very early that it is necessary to take responsibility for your life," says Ken. "That's what I try to do, and that's what I try to teach others. In any situation, if you take care of the little things, the big things won't even occur."

In a few years, Ken is planning to retire. What then? "I plan to do a little golfing in Florida," says Ken. "And I also plan to do some reflection on Viet Nam. My life has been so busy, that I haven't had a chance to sit back and sort out my feelings and thoughts on that time in history. I may even do some writing about it."

THE DEP IS A BIG, complex agency. It requires not only a lot of committed and intelligent people working cooperatively toward a clear goal, but it also requires the ongoing, timely availability of a tremendous amount of supplies, equipment, and support. It is clear that as long as Ken Seymour is running that particular effort, the job will get done. We can depend on that. So, from those who appreciate dependability and what it is all about, may we offer Ken Seymour a crisp and heartfelt salute. ■

DEP Proposes Solid Waste Plan

by
Leslie Lewis
Citizens' Participation Coordinator

ON SEPTEMBER 8, 1988, DEP Commissioner Leslie Carothers released the proposed Solid Waste Management Plan for the State of Connecticut. This plan will be the basis for solid waste management into the next century.

Historically, Connecticut's cities and towns have had the responsibility and the right to manage their own solid waste. This worked well when the solution was a low-technology dump or incinerator. As more and more of these dumps close, towns are faced with the prospect of rapidly rising disposal costs and a lack of available facilities. The needed solutions transcend municipal and regional boundaries.

Resource Recovery Plants on line can process about 75 percent of the future waste stream, or about 4,241 tons of garbage per day. More capacity will be needed, even with an aggressive recycling program. However, the plan sets limits on landfill expansion. In addition, provisions must be made for disposal of bulky wastes and ash residue.

The proposed plan calls for a stronger statewide strategy to solve waste reduction and waste disposal issues. The key components of the plan are as follows:

1) Waste reduction and recycling are major factors. The DEP is committed to exceeding the 25-percent goal required by law. This will mean new strategies for marketing recycled materials and for designing waste reduction initiatives.

2) Resource recovery must be the answer to the shortfall in disposal capacity.

3) A rigorous siting process is proposed for ash residue landfills. A comprehensive four-level siting service matrix for identifying potential sites is included in the plan.

4) A siting process is proposed for bulky waste disposal. The plan makes recommendations for securing bulky waste disposal capacity.

5) Legislative remedies are needed to give the state the ability to successfully implement a statewide solid waste plan. Especially important is the authority and financing to site land disposal facilities.

6) Economic compensation is proposed for host municipalities.

7) Technical assistance to municipalities for the handling of bulky waste is recommended.

8) Programs to measure the volume and types of solid waste generated more precisely, as well as to monitor the effectiveness of the recycling program, should be undertaken.

9) A study of transportation options, to be done in conjunction with the DOT, is also proposed.

The plan is proposed for adoption with substantial public input. Public hearings on the plan have been scheduled to solicit public response to the strategies, and special meetings will be held with local officials, environmental groups, and business and industry. Following the hearings, the Plan will be finalized and submitted to the 1989 session of the General Assembly, along with a report identifying suitable ash disposal sites and legislative initiatives.

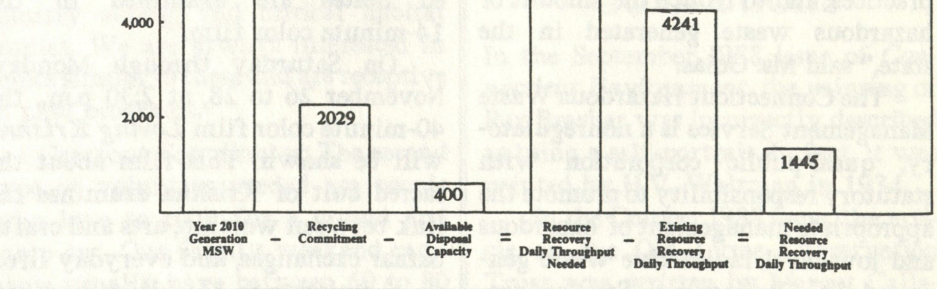
The following dates and places have been scheduled for the November public hearings:

November 10, 1988
6:30 p.m. - 11:00 p.m.
Baldwin Center - Main Hall
1000 Broadway Street
Stratford

November 14, 1988
6:30 p.m. - 11:00 p.m.
Municipal Bldg. Auditorium
295 Meridian Street
Groton

November 16, 1988
6:30 p.m. - 11:00 p.m.
Town Hall
Rt. 169
Woodstock

Please contact the DEP's Local Assistance and Program Coordination Unit at 566-2860 for more information about the Solid Waste Management Plan. ■



Resource recovery daily throughput needed to the year 2010. By that year, Connecticut will be producing about 8,000 tons of solid waste per day. Given the existing methods of disposal, that means about 1,500 tons more than we can handle. (Graph from the Connecticut Solid Waste Management Plan.)

The Bulletin Board

Hazardous Waste Grant

A federal grant of $320,000 has been awarded to the Connecticut Hazardous Waste Management Service and the Connecticut DEP to develop a comprehensive training and technical assistance program to minimize hazardous waste. The grant was awarded by the U.S. Environmental Protection Agency under its Resource Conservation and Recovery Act (RCRA) Integrated Training and Technical Assistance (RITA) Program.

"I am extremely pleased about the award," said Kathleen C. Golas, chairwoman and executive officer of the Service. "Thirty-eight states applied for funds, and Connecticut was one of only 14 states to receive a grant."

The Service is the lead agency for implementing the grant program which will be conducted over a three-year period in cooperation with the DEP. The program will include waste minimization training workshops and conferences, a survey of waste minimization activities in industries generating hazardous waste in Connecticut, and pilot waste minimization demonstration projects at volunteer industrial facilities.

"The goals of our program are to improve the training of state and industry personnel who have hazardous waste management responsibilities, to promote the use of better management practices, and to reduce the amount of hazardous waste generated in the state," said Ms. Golas.

The Connecticut Hazardous Waste Management Service is a nonregulatory, quasi-public corporation with statutory responsibility to promote the appropriate management of hazardous and low-level radioactive waste generated in Connecticut. Service programs include long-range planning, research, technical and financial assistance, and facility siting. The Service is separate from the DEP. ■

AIAI Events

The following events are scheduled at the American Indian Archaeological Institute in Washington, Connecticut:

On Saturday through Monday, November 5 to 7, at 2:30 p.m., the 30-minute film *How We Learn About the Past* will be shown. This film is an introduction to archaeology, presenting methods of locating and excavating a site and examining archaeolgical findings. It shows the unearthing of Indian artifacts in the southeastern United States.

On Saturday through Monday, November 12 to 14, at 2:30 p.m., the 25-minute color film *Fauna of Australia* will be shown. The film presents an overview of the wildlife of Australia. The continent's extraordinary animals are seen in their natural habitat as photographed by land-satellite imagery.

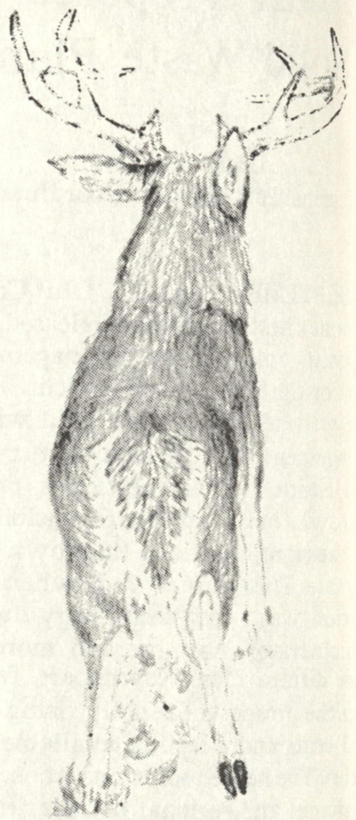
On Saturday through Monday, November 19 to 21, at 2:30 p.m., two films will be shown. *Southeast Indian Arts and Crafts* is a 14-minute color film about techniques that have been passed down from generation to generation to produce distinctive, beautiful crafts. Included are Navaho rugs, San Ildefonso and Acumo pottery, Hopi and Zuni jewelry, Kachina dolls, and Pima and Papago baskets.

Southwest Indians of Early America explores the ruins and rock art of the Anasazi Indians. The lifestyle of these and other ancestors of the Indians of the southwestern United States are examined in the 14-minute color film.

On Saturday through Monday, November 26 to 28, at 2:30 p.m., the 40-minute color film *Loving Krishna* will be shown. This film about the sacred cult of Krishna examines the link between worship, arts and crafts, bazaar exchanges, and everyday life.

Admission to AIAI is by membership or a donation of $2/adults, $1/children ages 6-18.

For further information, please phone (203) 868-0518. ■



Dinosaur State Park

The following events, sponsored by the Friends of Dinosaur State Park, are scheduled to take place at Dinosaur State Park in Rocky Hill:

November 15, 1988: "Plants of the Last Dinosaurs: Floral Change at the Cretaceous-Tertiary Boundary." Mr. Kirk Johnson, Department of Geology and Geophysics, Yale University. Forests were changing before the Cretaceous-Tertiary boundary extinctions wiped out the dinosaurs. This talk will focus on the new data about plant evolution, ecology, and extinctions at the time of the last dinosaurs. The methods by which this information is collected and how it is interpreted will also be discussed.

February 21, 1989: Topic to be announced. Dr. John Ostrom, Professor of Geology at Yale University and Curator of Vertebrate Paleontology at the Peabody Museum.

March 7, 1989: "Watersheds and Wetlands in Connecticut." Mr. Peter LeTourneau, Environmental Geologist, Haley and Alrich, Inc.

April 11, 1989: "What Makes Triceratops Run?" Dr. Walter Coombs, Jr., Associated Professor of Biology, Western New England College.

Donation: $2.50. Series Ticket: FDPA Member $10; Nonmember $12.50.

Each lecture will be followed by a question and answer period and coffee. Purchase tickets at the door or call 529-8423. All lectures begin promptly at 7:30 p.m.

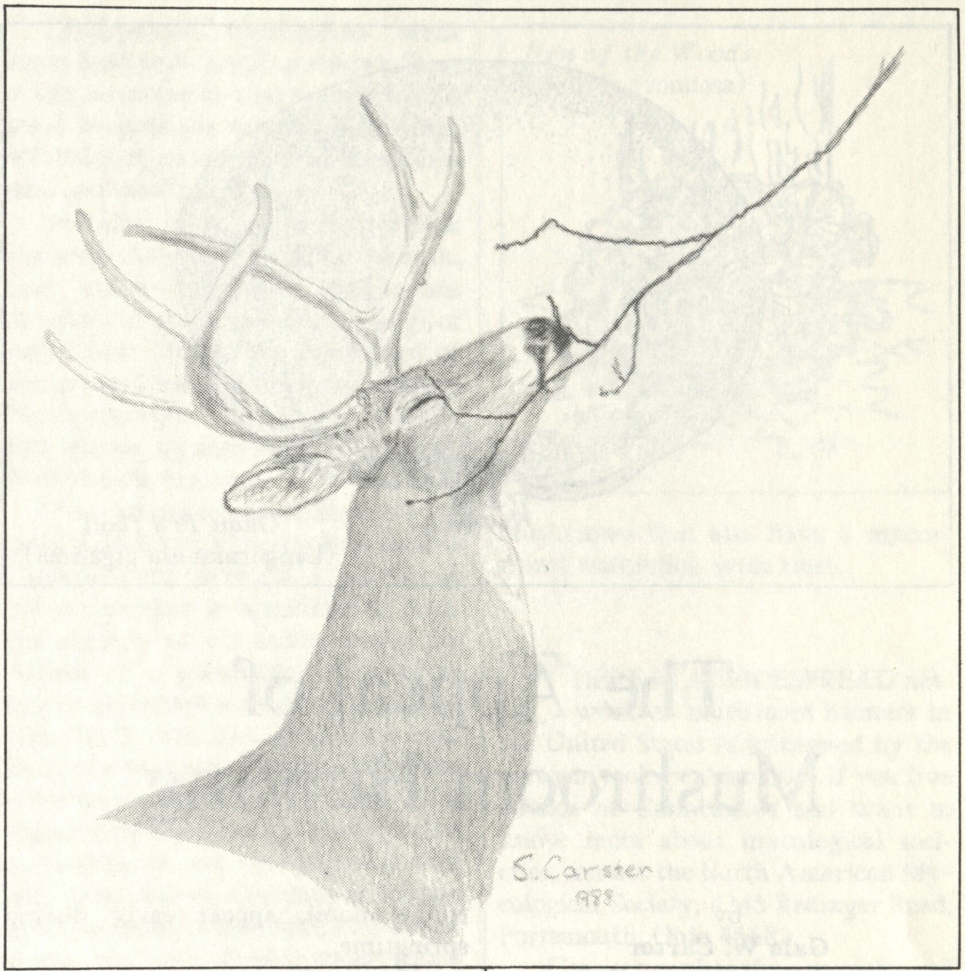
Family Natural History Series
(Free with Exhibit Center Admission)

November 19, 1:00-2:30 p.m. "Astronomy." Ms. Karen Gloria, Chief Telescope Operator at the Van Vleck Observatory, Wesleyan University.

December 1:00-2:30 p.m. Date to be announced. "What is a Naturalist?" Les Mehrhoff, Biologist, State of Connecticut.

January 21, 1989, 1:00 p.m. (Snow Date January 28) "Endangered Species of Connecticut: Bald Eagles." Ms. Rita Maroncelli-Duclos.

February 18, 1989, 1:00-2:30 p.m. (Snow Date February 25) "Tropical Rain Forests and Why Connecticut Residents Should Want to Save Them." Dr. Carl Rettenmeyer, Director of the Connecticut State Museum of Natural History. ■



Looking for a Few Good Naturalists

The DEP's Family Outdoor Discovery Program is a year-round series of educational workshops on topics of environmental interest geared for the general public. This series, which began in 1983, has grown to the point where volunteers are needed as workshop leaders who can participate on Saturdays, Sundays, at evening programs, or as campout coordinators for our weekend overnights. The job descriptions are:

Workshop Leaders: These volunteers would be able to conduct an informative and educational program from one to two hours in length. Previous topics have included ice fishing, outdoor photography, dinosaurs, water quality and sampling, orienteering, environmental theater programs, cross country skiing, and critical habitat studies. We are always interested in topics similar to these and are receptive to new programs.

Campout Coordinator: The second type of volunteer needed are people who love to cook for a crowd and camp out. Our family weekend campouts usually have between 60 to 80 people in attendance. For the most part, the families take turns cooking and cleaning. But someone is needed to coordinate all of this. The ideal candidate would be able to set up and organize the food tent, make sure the fires are going, and lend a hand to first-time campers.

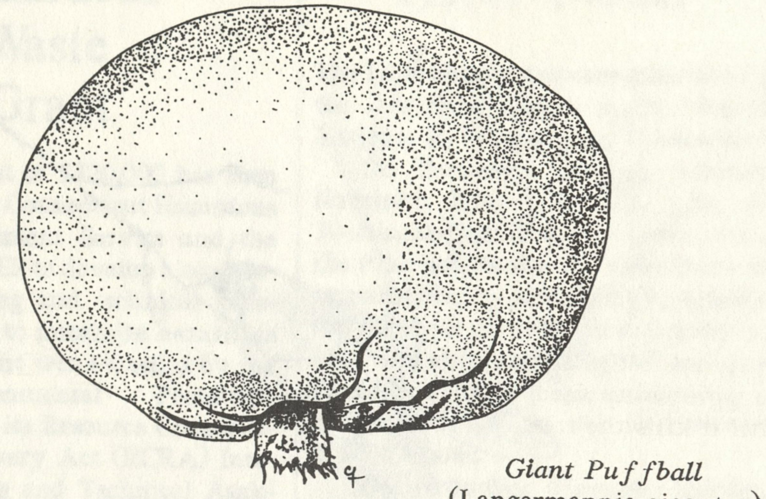
So, if you like the outdoors, meeting new people, learning about the DEP, and visiting state parks and forests, have we got a job for you. For further information, call Martina Delaney at 566-8108 or 566-5599. ■

Corrections

In the September 1988 issue of *Connecticut Environment*, the painting of Rex Brasher was incorrectly described as being a self-portrait. In fact, it was painted by H.V. Waltman in 1934.

In the October 1988 issue, the article on the Old Lyme Conservation Trust was written by Margot Callahan, and should have been attributed to her.

We deeply regret any inconvenience caused by these errors. ■



Giant Puffball
(Langermannia gigantea)

The Appeal of Mushroom Hunting

by
Gale W. Carter
Illustrations by
Caryn Furbush

WHAT is the special appeal of mushroom hunting? For many, it is the prospect of a delectable meal; others are excited by the color and beauty of mushrooms and by their unusual shapes and growth habits. Then, there is the thrill of discovering a new mushroom. Often, there is a need for detective work to piece together all the characteristics for a proper identification.

WHERE do mushrooms grow and when do we look for them? Mushrooms can be found almost anywhere, if conditions are right. They appear at all seasons, but most are present during the summer and fall. Only a few mushrooms, like the edible morel, appear early during springtime.

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Mushrooms appear on lawns, in fields and gardens, but a wooded area is probably the best site, with its variety of habitats. This is particularly true if there are rotting logs and fallen branches.

Notice where you find the mushroom growing. Is it found on the ground, at the base of a tree, or is it growing on some other part of the tree? Is the tree cone-bearing or broad-leaved? Some species of mushrooms are partial to one or the other; a few will grow on either type.

IS THE MUSHROOM GROWING singly or in groups? These characteristics, along with other features, are important in mushroom identification. The making of spore prints and observation of the spores with a microscope are necessary in some cases.

What conditions does a mushroom need to develop its fruiting body? Temperature, humidity, light, wind, and nourishment from a substrate all play important roles in a mushroom's growth. Each species of mushroom has its own specific needs in relation to the above factors. Most species require some light, but some mushrooms are raised in caves and mines. Many species need the heat of the sun to develop properly; others avoid this heat.

Some mushrooms last only a few days or, in some cases, only one day. This is because their underground threads (mycelia) that absorb moisture wither and die, being unable to pick up enough moisture. Substrate, like wood, retains moisture longer than the litter of fallen leaves. Mushrooms that live on dead and decaying material survive best during dry periods.

SOME MUSHROOMS EXIST in "fairy rings." They grow in an ever-widening circle as they exhaust their food supply of dead and decaying matter. Some "fairy rings" have been known to exist for several hundred years.

Sometimes, wind can cancel out the benefits if it persists for any length of time. The wind causes the thread-like mycelia to dry up and die.

During the past unusually hot summer, I have made weekly trips to observe mushrooms in a hemlock gorge. Those mushrooms that I found the first two weeks were mostly the woody shelf fungi (the polypores) that have persisted from year to year, or that had developed during the spring or early summer. The third week, we had one day of rain. I found that this brought forth quite a few new mushrooms and slime molds.

One of the most dramatic mushrooms was the beautiful "chicken of the woods," or sulphur polypore. It appeared on a rotting log at the same site where I had observed it the previous season. I would estimate that its fruiting body would weigh several pounds. Two weeks later, there was little evidence that the mushroom had been there. Its quick disappearance may have been due to the ants that we saw at work on it soon after it appeared.

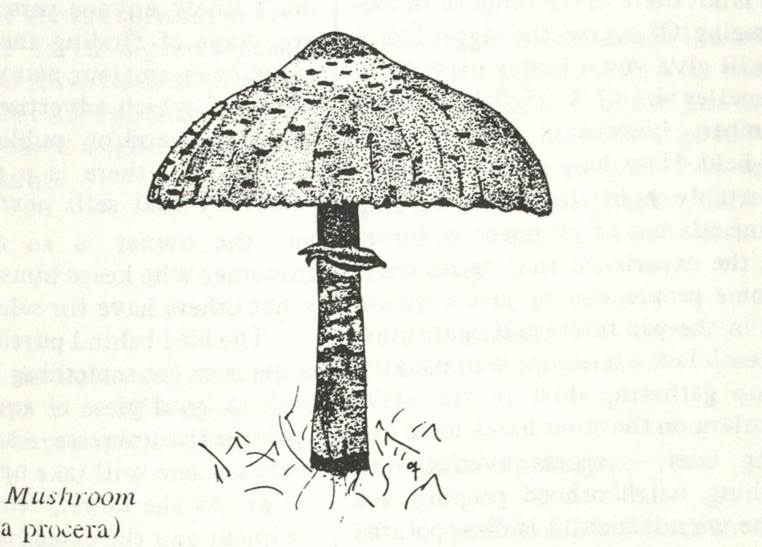
The fourth week was the rainiest of the summer, with over four inches of rain. This seemed to have more of an adverse effect on the mushrooms. Many of them had disappeared.

The final three weeks that I was visiting the gorge, the weather was hot and sometimes humid. This did not suppress the supply of mushrooms. Quite a variety of specimens were observed.

Mushroom hunting in the gorge was not quite as good as it was during the same period in previous years, but it did seem that once the mushrooms got some moisture to start their development, enough moisture was retained in the various substrates to allow them to produce fruiting bodies.

WHAT role do mushrooms play in the environment? Mushrooms are the decomposers of organic matter. The thread-like mycelia secrete enzymes that help to break down organic material so that it can be recycled.

The specific role of a mushroom varies with the species. Some are saprophytic, others are parasitic, or have mycorrhizal associations with certain species of trees.



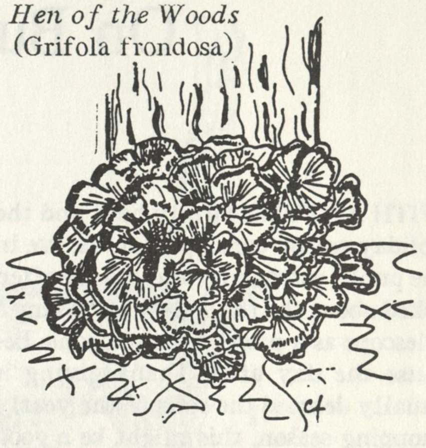
Parasol Mushroom
(Lepiota procera)

Saprophytic mushrooms break down dead and decaying matter. Some of the mushrooms that belong to this group include the morels, jelly fungi, puffballs, stink horns, dead man's fingers, and bird's nest fungi.

Parasitic mushrooms may attack live trees through a break in the bark. Some common parasitic mushrooms are many of the woody shelf fungi, or conks, that attack the heartwood of living trees; and the honey mushroom that first attacks the roots of a tree and then grows upward under the bark until it kills the tree.

The last group of mushrooms are the mycorrhizae. This is where there is a relationship between a mushroom and a tree that is beneficial to both. The mycelia of a mushroom and the rootlets of a plant become fused to form a structure known as a mycorrhiza. This relationship enables both the tree and the mushroom to become better nourished. If you are looking for a particular mycorrhizal mushroom, a knowledge of tree identification will help your search. Common examples of mycorrhizal relationships are found among the soft, fleshy-pored bolete family; e.g. ash tree bolete (*Gyrodon meruloides*), near ashes, and maples; and chicken fat Suillus (*Suillus americanus*) under eastern white pine. The *Amania*, *Russula* and *Hygrophorus* are a few families among the gilled mushrooms that also have a mycorrhizal association with trees.

Hen of the Woods
(Grifola frondosa)



THERE IS A WIDESPREAD network of mushroom hunters in the United States as witnessed by the many mycological societies. If you live outside of Connecticut and want to know more about mycological societies, contact the North American Mycological Society, 4245 Redinger Road, Portsmouth, Ohio 45682.

Connecticut has three mycological societies: Connecticut Mycological Association, Route 3, Box 137B, Pound Ridge, N.Y. 10576; Connecticut Mycological Society, P.O. Box 530, Groton, CT 06340; Nutmeg Mycological Society, P.O. Box 530, Groton, CT 06340. These societies will be of interest particularly to those who want to learn about mushrooms that are edible.

I have found myself getting more and more interested in mushrooms as I learn more about them. They are found in so many habitats that they may be as close to you as your own backyard. As one mushroom collector said, "Mushrooms are where you find them." I hope you will join the evergrowing number of people turned on by the beauty of mushrooms.

CAUTION. Please, please, do NOT eat any mushrooms you find in the wild before consulting with a reputable authority. ■

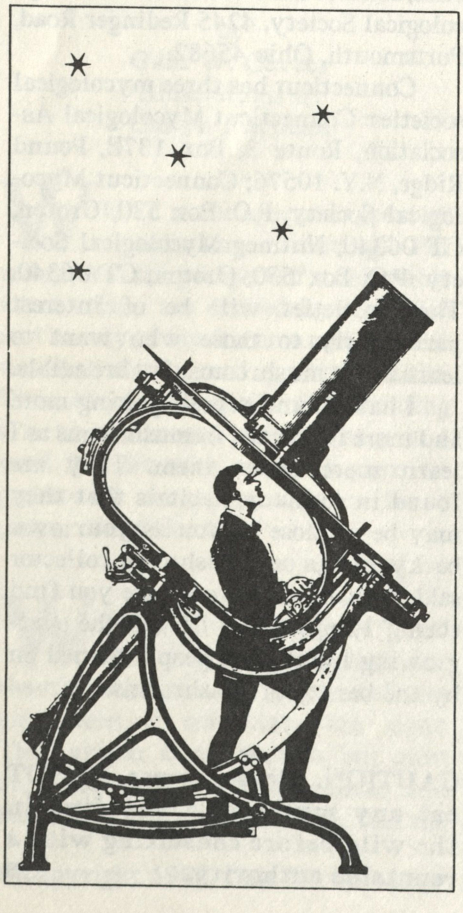
The Night Sky

On Buying Just the Right 'Scope

by
Francine Jackson

WITH AUTUMN firmly here, and the holiday season coming upon us, we in the public astronomy domain are often asked about the feasibility of buying a telescope as a present for someone. Because the day after Thanksgiving is usually deemed the start of the yearly shopping season, this might be a good time to think about this.

Buying an astronomical telescope is not as easy as it sounds. Several factors must be taken into account. First, whom is this instrument for? A child's first telescope? An up-and-coming adult amateur? Someone who merely wants a classy, brassy room adornment? What will it be used for? What's out there, waiting for the curious customer? And, most importantly, costing how much?



During this season, almost every type of store, from discount to camera to specialty, will sprout a telescope in its display windows, usually with an accompanying flyer containing the ultrabenefits of this (these) particular model(s). For the most part, these, generally priced in the $100 - $200 category, will not satisfy a person seriously contemplating the wonders of the heavens. Incidentally, if you do purchase one of these telescopes, and it happens to come with a "sun filter," a black, coin-sized disk meant to be placed on the eyepiece, THROW IT AWAY! Those disks do not have the necessary tolerance for the amount of heat reaching them, and they have been known to break. The potential for eye damage to someone looking at the sun and having one of these disks break is too great to take a chance.

Well, if not one of these, then what? Quite honestly, if the person -- child or adult -- is just getting into the hobby, and you wish to spend around $100, I recommend a good pair of binoculars. Many amateur astronomers use nothing but binoculars to sweep the sky. You'd be amazed what is out there in the range of binocular seeing. Of course, the bigger (10 X 50) will give you a better view than the smaller size (7 X 35, 7 X 50), but remember: binoculars are usually hand-held. How long can the viewer comfortably hold them? My feeling for binoculars as a first telescope comes from the experience that astronomy, for some people, can be just a quick, flash-in-the-pan interest. If that interest doesn't last, a telescope will usually end up gathering dust in the attic; binoculars, on the other hand, have unending uses -- sports events, bird watching, neighborhood peeping, etc. By the way, if a child is disappointed in only receiving binoculars, remind him/her that binoculars are actually two telescopes strapped together.

IF YOUR RECIPIENT has graduated from the binocular phase, then you really should consider a good quality astronomical telescope. The way to get one is to look at the ads in a good astronomy magazine, such as *Sky & Telescope* or *Astronomy*. However, you will notice two things: Good telescopes are expensive, and there are an awful lot of them out there. Most of the ads have an 800 number, and most companies can have you speak with someone who might be able to help you.

There is one other possibility -- buying a good, used telescope. This isn't as far-fetched as it sounds. There are lots of amateur astronomers out there, and they are always looking to improve their "seeing" by buying newer, improved equipment. Don't worry about buying their used stuff; amateur astronomers use their telescopes until the day they sell them, and they don't want to compromise on ability.

If this idea appeals to you, but you don't know anyone personally, there are ways of finding them. Most regions have amateur astronomy clubs, many of which advertise their meeting dates and/or public observing times. Also, there is a company in Simsbury that sells new equipment, but the owner is an amateur astronomer who keeps himself aware of what others have for sale.

The idea behind purchasing a telescope is to get something that will be used. A good piece of equipment can open up the universe -- a bad, or mismatched, one will take up space in the cellar. As the buyer, remember your recipient and the extent of his/her interest. ■

Letters to the Editor

Three cheers for *Connecticut Environment*. In the "Editor's Note" of the September issue, we were aptly reminded that this jewel of a publication is not meant to be glitzy or slick. *Connecticut Environment* touches the conscience and makes us truly see the world we live in. To add color and glitz would be counter-productive. The magazine is perfect as it is. Bravo to the DEP.

Kathleen Bennett
Madison

I'm with you on *Connecticut Environment* priorities -- and, in fact, am not at all sure that the addition of color wouldn't tend to replace some the things I enjoy most about the magazine, viz., the wonderful artwork, such as, in the September issue, Michael Klein's marvelous cover and Elaine Avis Mathias' drawing of the Sleeping Giant.

I have appreciated your editorial comment and feeling in every issue -- no glitz or slick could obscure that -- still . . .

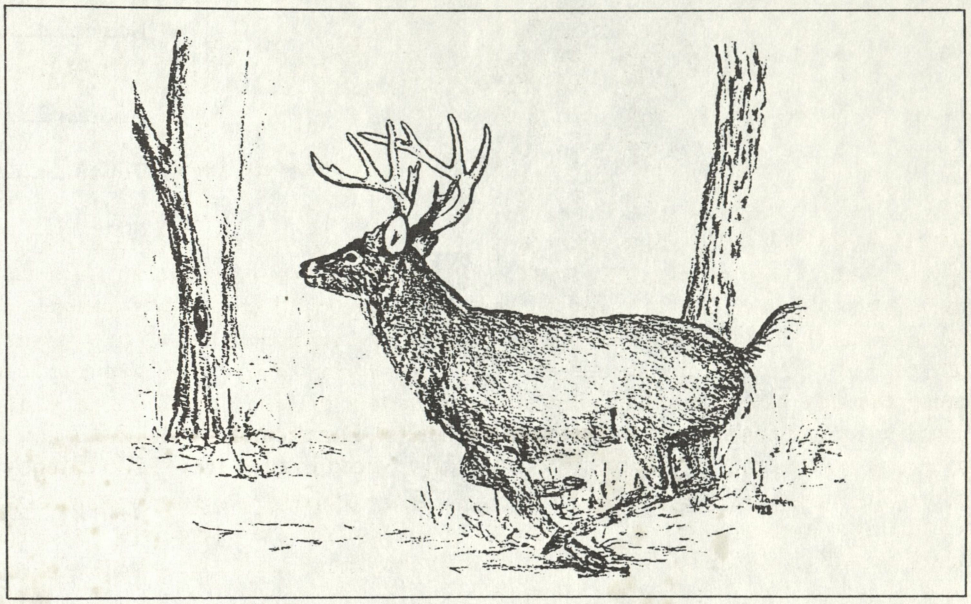
Lois Kelley
Hartford

This is to express my pleasure in and support of the views expressed in your "Editor's Note" for the September issue of *Connecticut Environment*. Please go slowly toward color and slickness, and please never adopt a cellophane cover for the magazine.

Doris E. Cook
Hartford

Never mind the color and the glitz. Your magazine is terrific as is. The DEP seems to be pretty great, too. Keep it up.

Yolanda B. Gobes
West Hartford



The September issue of *Connecticut Environment*, received today, prompted me to write and tell you how much I enjoy and look forward to each issue.

As both a selectman and private citizen, I am particularly concerned about pollution of our waterways. My immediate focus is on the great quantity of trash strewn on the bank of the Farmington River in the Tariffville Gorge-Dam stretch.

Keep up the excellent work. *Connecticut Environment*'s message must be heard.

Carolyn Phillips
East Granby

Connecticut Environment is a delight. I look forward to every issue and pass it on to a friend. I love it just as it is, and wouldn't like to see it go color and "glossy." We have more than enough glitz as it is. Your publication is a refreshing return to basics and is very rewarding.

Vera L. Johnson
Clinton

Best $6.00-worth ever.

Donald and Kathleen Hazelton
Dalton, Massachusetts

Stay as sweet as you are. Forget the glossy and avoid colorization. What a joy with no pullouts or ads. Hang in there.

Mark N. Glynn
Winsted

This is the most interesting, informative, and understandable magazine about nature that I have ever read. Thanks.

Pauline Johnson
Manchester

Endnote

"Far out in the uncharted backwaters of the unfashionable end of the Western Spiral arm of the Galaxy lies a small unregarded yellow sun. Orbiting this at a distance of roughly ninety-eight million miles is an utterly insignificant little blue-green planet whose ape-descended life forms are so amazingly primitive that they still think digital watches are a pretty neat idea."

Douglas Adams

There are still some things you can trust.

Connecticut Environment is one of them.

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